

## Can Electric Vehicles Along Save the Planet?

Previously, I have researched about the imminent crude oil production peak in many countries around the world. In search of an alternative technology for the transportation sector, electric vehicles have slowly risen to dominance. However, the following series of numbers will prove to you that electric vehicles alone will not be the solution to energy crisis.

Since electric vehicles do not directly consume fossil fuel, the generation of electricity must be identified to accurately assess the sustainability of an electric vehicle-based mobility system. According to statistics from International Energy Agency, fossil fuels accounted for [84.3%](#) of the total primary energy supply in 2009. Within the many types of fossil fuels, oil accounting for [37.1%](#), natural gas with [24.7%](#), and coal/peat taking up another [22.5%](#) are the main types of fossil fuels used for electricity generation. Sadly, only a negligible [5.8%](#) of renewable energy resources was used as primary energy supply in electricity generation in 2009. In stark contrast, European Union plans to increase the percentage of electricity generated from renewable resources to [30-40%](#) by 2020, resulting in a [reduction](#) of electricity mix emissions of 14-66 gCO<sub>2e</sub>/kWh versus 312-364 gCO<sub>2e</sub>/kWh in 2009. Further, fossil fuels are [estimated](#) to emit an astonishing 600-1200 gCO<sub>2e</sub>/kWh. To put this number in context, nuclear energy yields about 10-130 gCO<sub>2e</sub>/kWh, wind and hydro energy at 10-25 gCO<sub>2e</sub>/kWh, solar photovoltaic 30-100 gCO<sub>2e</sub>/kWh. As the numbers sufficiently demonstrate, renewable energy resources have much lower, in fact close to zero, level of greenhouse gases emissions, with most of it coming from upstream supply storage, power plant construction and decommission that are all indirectly related to electricity generation.

Moving beyond source of electricity, electric vehicles still have many sustainable promises to fulfill. Adaptation and the widespread of electric vehicles depends on a combination of factors. A group of researchers proposed [108 different scenarios](#), and then compared them with each other. The results are not so optimistic for the electric vehicle industry. Under the most favorable set of conditions where the price of fossil fuel is high, policies on greenhouse gases emissions are strict, the cost of batteries are cheap, and there is a presence of renewable portfolio standard, the predicted market share of electric vehicles fails to surpass half of the market at 42%. Additionally, the reduction in greenhouse emissions turns out to be far from remarkable. From an economic standpoint, electric vehicles are still not as appealing as conventional, gasoline-burning cars. In many case, the initial premium to purchase an electric vehicle take the entire lifetime of the product to pay it back. For now, we can only hope the situation will reverse as battery technologies advance. Lastly, manufacturing the batteries for electric vehicles is environmentally controversial. The [black soot](#) in some cities of China as a consequence of lithium mining has been brought to attention, causing forced shutdown of the mines temporarily.

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